

Water System Improvements Plan and Water Rate Evaluation



Prepared for:
City of Sturgis Municipal Water Board
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Presented by:



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December 21, 2009

Presentation Outline

- Current Water Usage
- Existing System
- Priority Projects
- Budget and Funding
- Water Rate Evaluation
- Funding

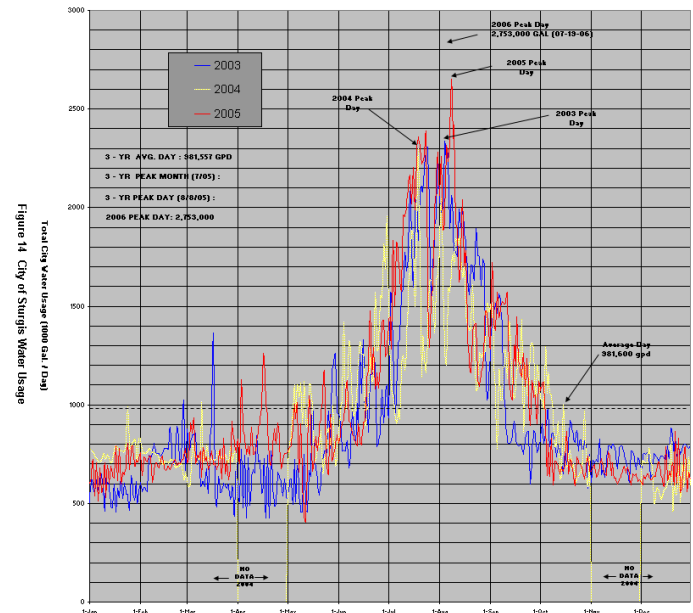


Current Water Usage

- Consumption Summary



- **Total Customers**
 - Residential 2,869 services
 - Commercial 365 services
- **Total Consumption**
 - 1 MGD
 - (Average Day from 2003 through 2005)
 - 251 MG in 2008
 - 185 MG Residential
 - 66 MG Commercial
 - Peak Month: 2.2 MGD (July 2006)
 - Peak Day: 2.75 MGD (7-19-2006)
 - Peaks Depend on Annual Precipitation

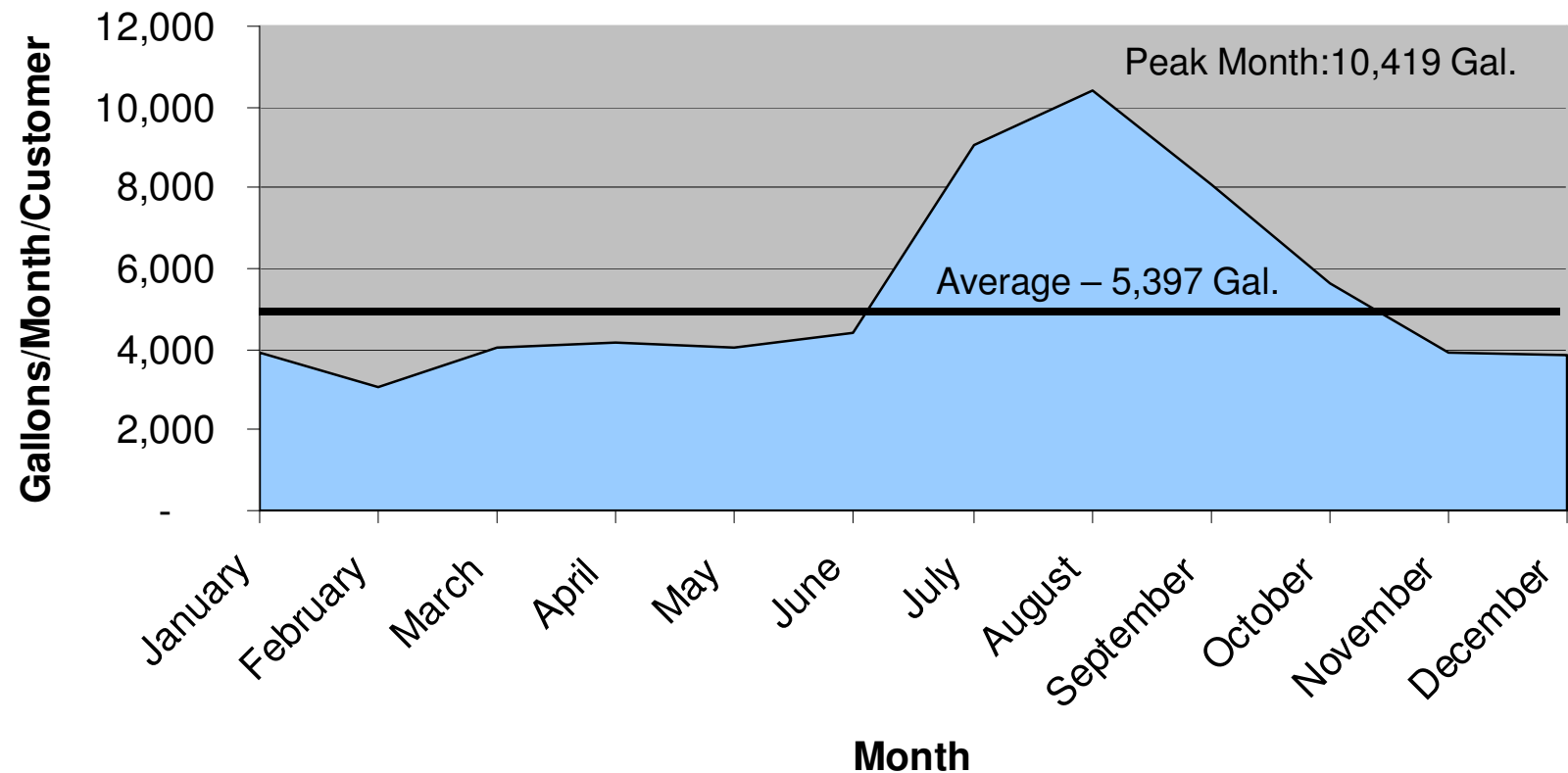


Current Water Usage

- Residential Consumption



2008 Monthly Residential Water Usage per Consumer

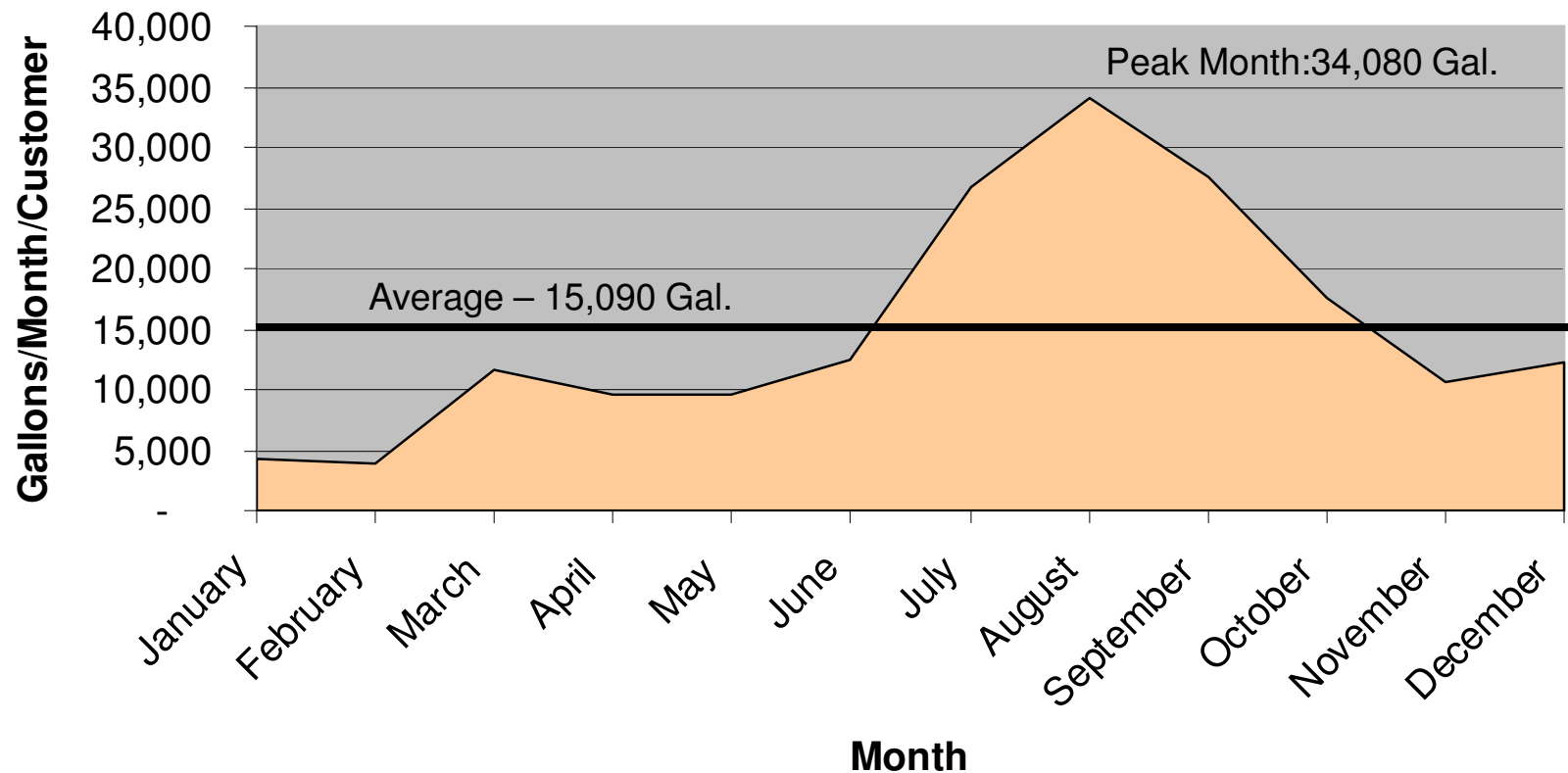


Current Water Usage

- Commercial Consumption



2008 Monthly Commercial Water Usage per Consumer



Existing System

- Wells (Supply)



- **Well Summary**

- Existing Conditions: Well supply aging with 32 year old average
 - Typical well casing well house infrastructure has 50-60 year life
 - Frequent well repairs & Poor Well House Conditions
 - All wells required in July and August to meet peak-day demand
 - Heavy reliance on Well 7



Well Condition Summary

<u>Well No.</u>	<u>Typical Pumping Rate</u>	<u>Current Well Age</u>	<u>Water Quality Issues</u>	<u>Recommendations</u>
1	350 gpm	61 years	Yes	Replace
2	245 gpm	59 years	Yes	Replace
3	370 gpm	42 years	No	Upgrade / Replace
4	310 gpm	27 years	Yes	Sand Upgrades /Replace Well House
5	300 gpm	22 years	No	Minor Upgrades
6	300 gpm	7 years	No	Minor Upgrades
7	625 gpm	6 years	No	Add booster pump and minor upgrades
2,500 gpm		Average: 32 years		

Existing System

- Water Storage



- **Storage (1.2 MG TOTAL)**
 - Existing Condition
 - North Steel Tank
 - 490,000 Gallons (HGL: 3770)
 - North Concrete Tank
 - 150,000 Gallons (HGL: 3620)
 - South Steel Tank
 - 560,000 Gallons (HGL: 3770)



Existing System



- SCADA / Distribution

- **SCADA**
 - System operation and alarms software
- **Pine Acres Booster Pump Station**
 - Serves Pine Acres Pressure Zone



Existing System



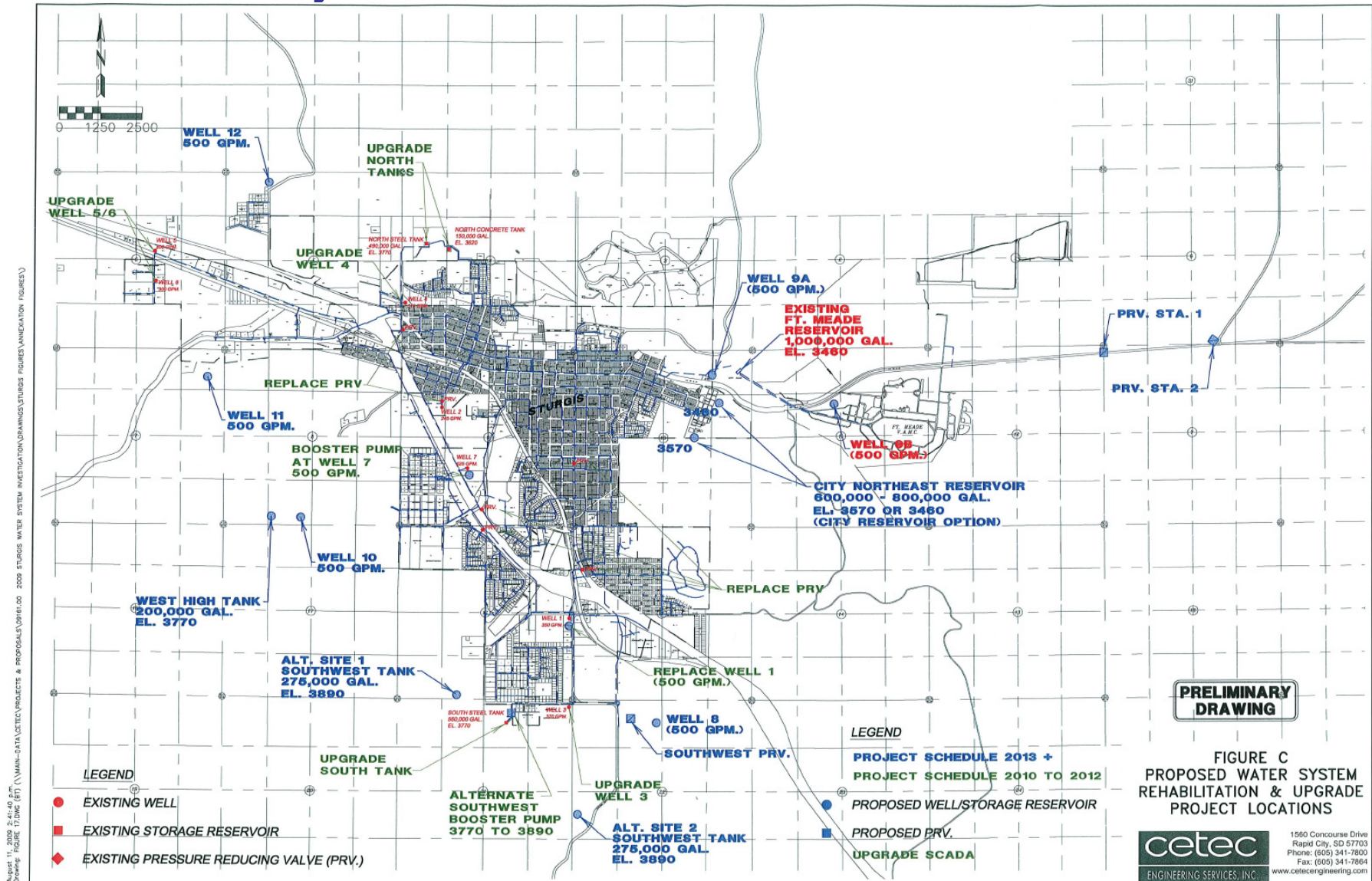
- Distribution

- **Pressure Reducing Valves (PRV's)**
 - 6 Total PRV Stations
 - Reduces water pressure between zones
 - Average Age = 20 years minimum (likely 40 years old)



Priority Projects

- Project Locations (Green = 2010-2012)



Priority Projects



- Project List & Cost Estimates

Project 1 (Summer 2010)

Well 7 Booster Pump System Upgrade	\$	206,682
Well 1 Removal and Replacement	\$	1,144,378
Pine View Booster Pump & PRV Station & Well 3 Upgrades	\$	235,118
SCADA System Upgrades	\$	51,375

Project 1 Total Cost: \$ 1,637,553

Project 2 (2012 - 2013)

North Steel Tank Upgrades	\$	84,207
South Steel Tank Upgrades	\$	59,311
North Concrete Tank Upgrades	\$	71,027
Pressure Reducing Valve Stations (6 total)	\$	623,862
Well 4 Upgrades	\$	42,117
Well 5 Upgrades	\$	42,117
Well 6 Upgrades	\$	42,117

Project 2 Total Cost: \$ 964,758

TOTAL CAPITAL IMPROVEMENTS COST:	\$ 2,602,311
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Project 3 (2013 +/- DOT Dependent)

Lazelle Street Water Main	\$	1,579,028
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Project 3 Total Cost: \$ 1,579,028

Project 4 (2014 +/-)

Main Street Water Main	\$	1,068,755
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Project 4 Total Cost: \$ 1,068,755

Priority Projects



- Project Descriptions

- **Project 1** **\$1,680,640**
 - Well 7 Booster Pump Upgrade
 - Install booster pump within existing well house
 - Provide additional 600 gpm supply from most reliable well
 - Well 1 Removal & Replacement
 - Remove oldest well and well house
 - Drill new well
 - Construct new well house
 - SCADA Improvements
 - Install SCADA components throughout system
 - Upgrade &/or replace existing SCADA software
 - Improve alarm system
 - Pine View Booster Pump & PRV Station
 - Remove and Replace Pine View Booster Pump
 - Construct Above-Ground Booster Pump Station with PRV
 - Install new water main
 - Well 3 Upgrades
 - Automatic Flush Valve
 - Pitless Adapter
 - Repair damaged well house structure
 - Chemical feed adjustments



Priority Projects



- Project Descriptions

- **Project 2** **\$966,314**
 - Tank Upgrades
 - Construct above-ground valve pits
 - Repair inadequate overflow systems
 - Repair security fence
 - Pressure Reducing Valve Stations
 - Construct Above-Ground Valve Stations
 - Install SCADA
 - Well 4, 5, & 6 Upgrades
 - Repair damaged well house structure (roof, insulation, etc.)
 - Chemical Feed Adjustments
 - Automatic Flush Valve (Well 4 & 5)
 - Pitless Adapter (Well 4)



Priority Projects



- Distribution Improvements

- **Note: Schedule for Lazelle Street Reconstruction is SDDOT dependent**

Project 3: \$1,579,028

– Lazelle Street (2013 +/- DOT dependent)

- Undersized Water Mains
 - Series of 6" and 4" Mains
- Aging System
- Important Commercial Water Main

Project 4: \$1,068,755

– Main Street (2014 +/-)

- Aging System
- Non-functioning valves and curb stops
- Difficult and expensive repairs due to street section
- Source of downtown water during peak demands

Budget & Funding



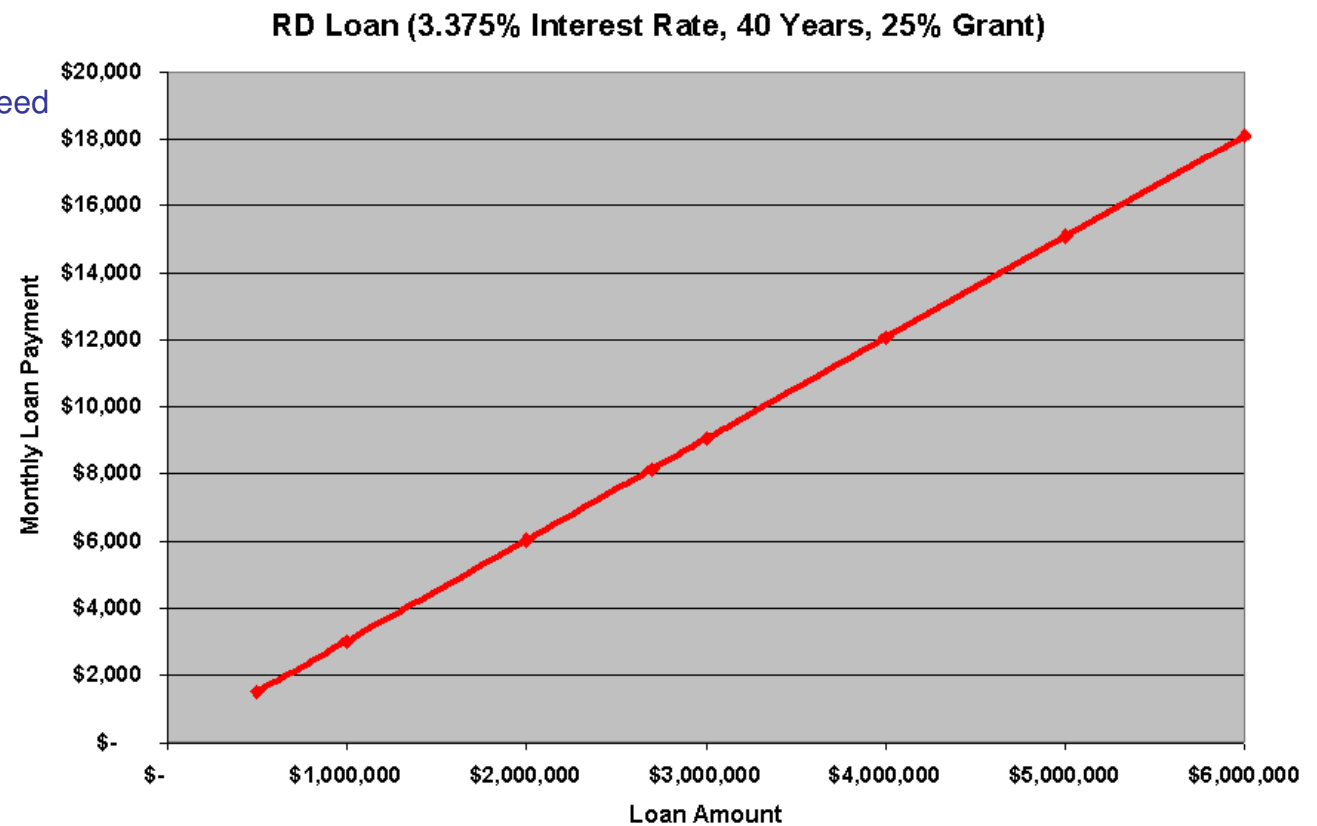
- **Budget**
 - 2008 water rates broke even with total expenses
 - No major system upgrades in 2008
 - Budget only covers general maintenance and normal operations
 - Capital Improvements require Additional Funding / Revenue
 - Reserves scheduled for small capital improvements and to cover electrical rate increase
- **Funding**
 - Rural Development
 - USDA
 - 3.375% Eligible Interest Rate
 - 40 Year Loan
 - Grants
 - Possible Community Development Block Grant (CDBG)
 - RD 25% Grant (Eligibility 15-35%)



Budget & Funding



- **Funding**
 - Rural Development
 - USDA
 - 3.375% Interest Rate
 - 40 Year Loan
 - Graph includes
 - 25% Grant
 - Not Guaranteed



Water Rate Evaluation

- Historical Structure



1983

<u>Gallons</u>	<u>\$/1,000</u>
0 – 1,000	\$8.25
1,000 – 100,000	\$1.50
100,001 – 200,000	\$1.00
200,001 +	\$0.50
Avg Residential:	\$16.35
Avg Commercial:	\$30.87



2007 (current)

<u>Gallons</u>	<u>Rate</u>
Min Residential	\$10.00
Usage Fee	\$2.00 / 1,000
Min Commercial	\$10 to \$80

Avg Residential: \$20.79
Avg Commercial: \$45.99

1990

<u>Gallons</u>	<u>\$/1,000</u>
0 – 1,000	\$10.00
1,000 – 100,000	\$1.80
100,001 – 200,000	\$1.20
200,001 +	\$0.60
Avg Residential:	\$19.74
Avg Commercial:	\$37.14

***Avg Rates based on average water usage for residential and commercial users in 2008
 (Residential = 5,397 gal/month Commercial = 15,079 gal/month)**

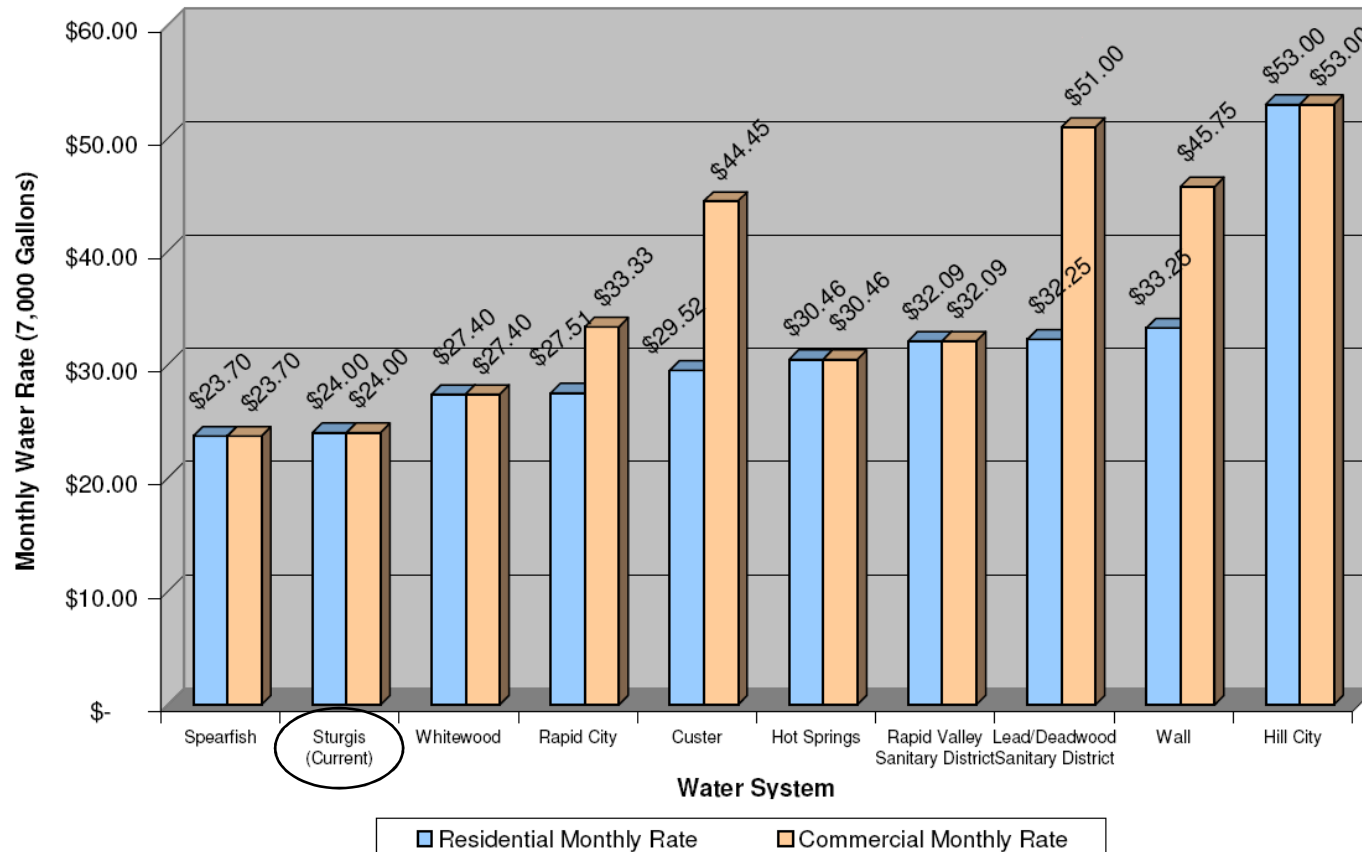
Water Rate Evaluation



- Regional Rate Structures (2009)

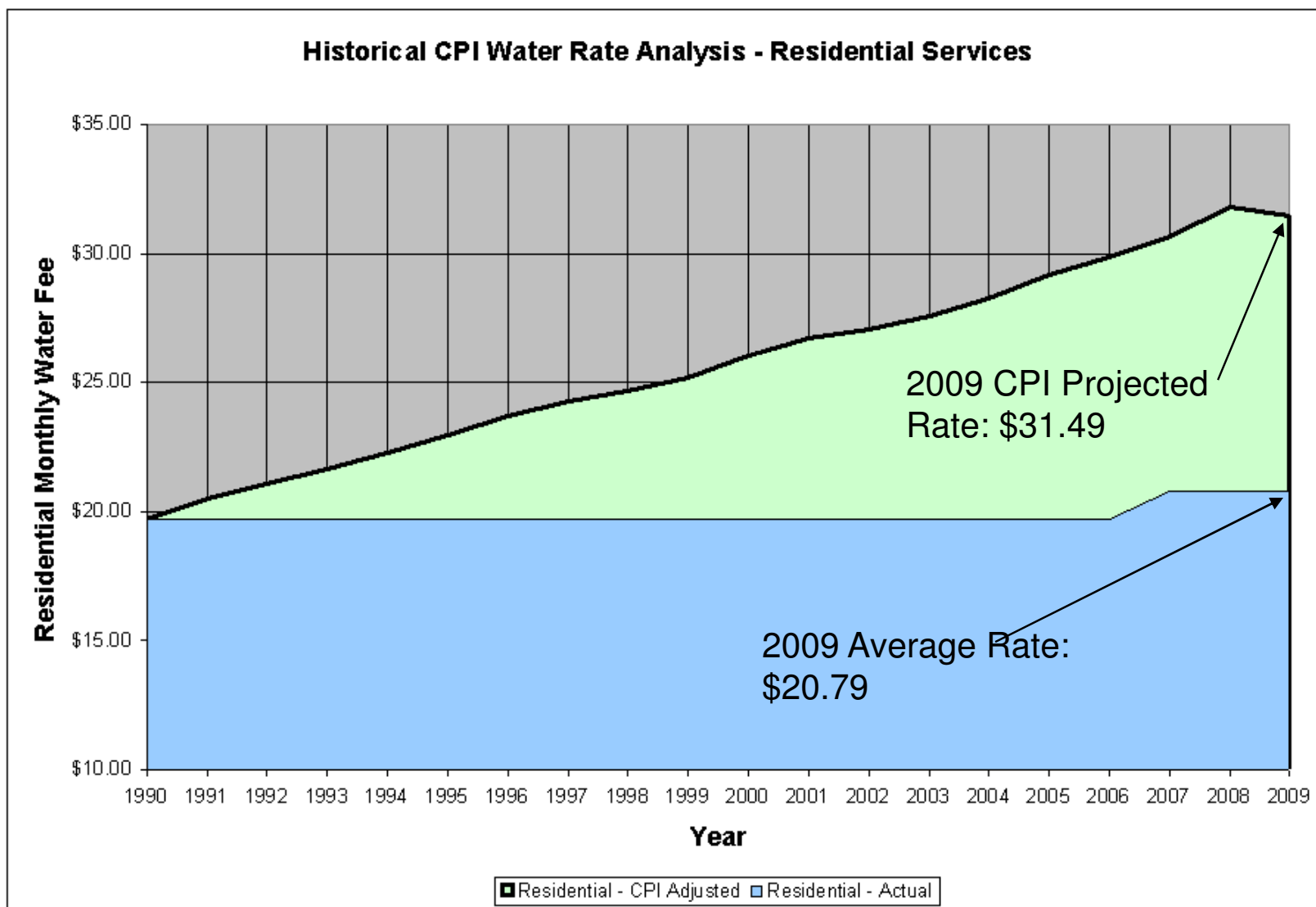
- Monthly Rates based on 7,000 gallons consumption
- Commercial Rates based on 1" Service Line (where applicable)

Summary of Regional Water Rates



Water Rate Evaluation

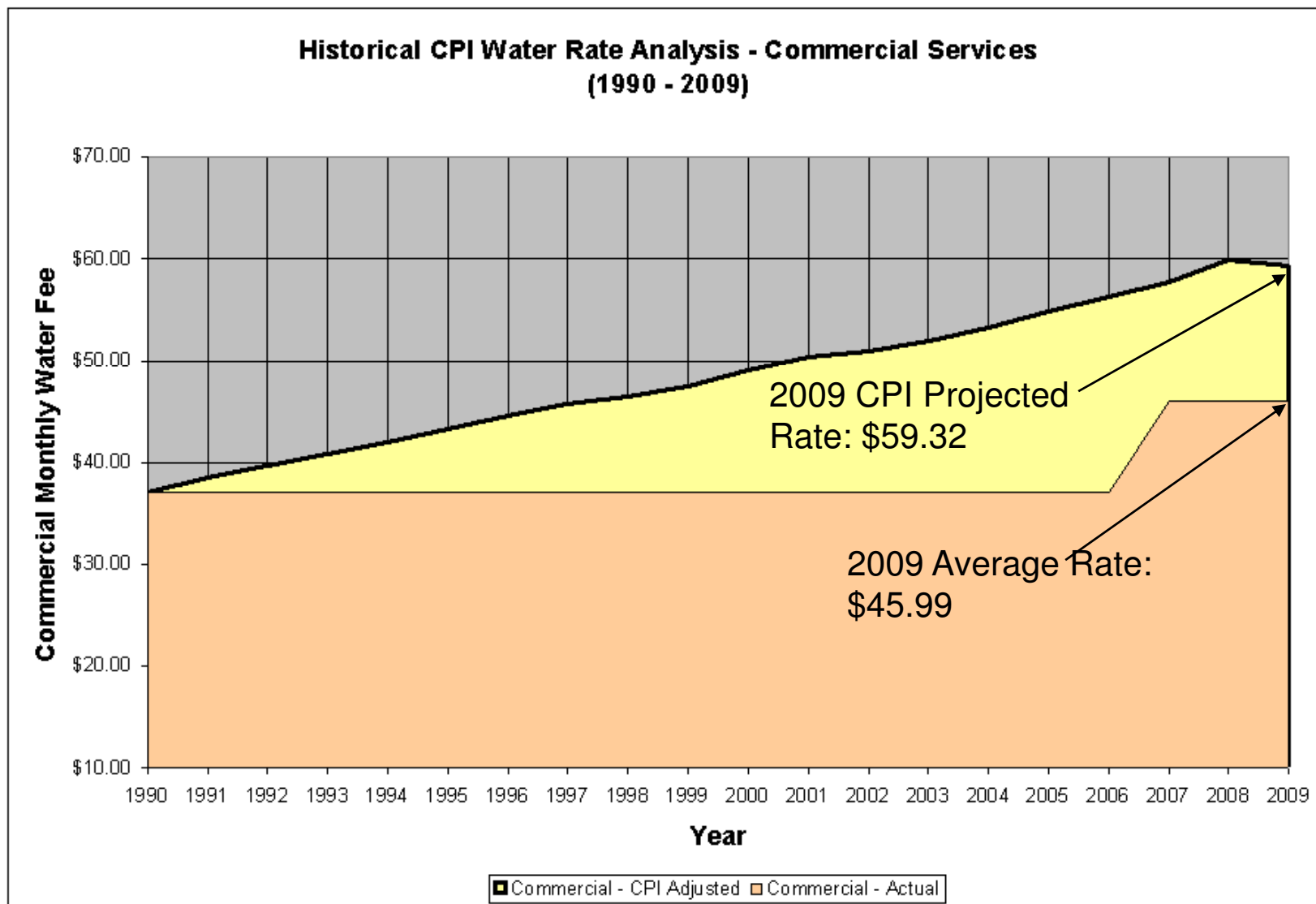
- CPI Analysis (1990 to 2009)



Water Rate Evaluation



- CPI Analysis (1990 to 2009)



Water Rate Evaluation

- Recommendations



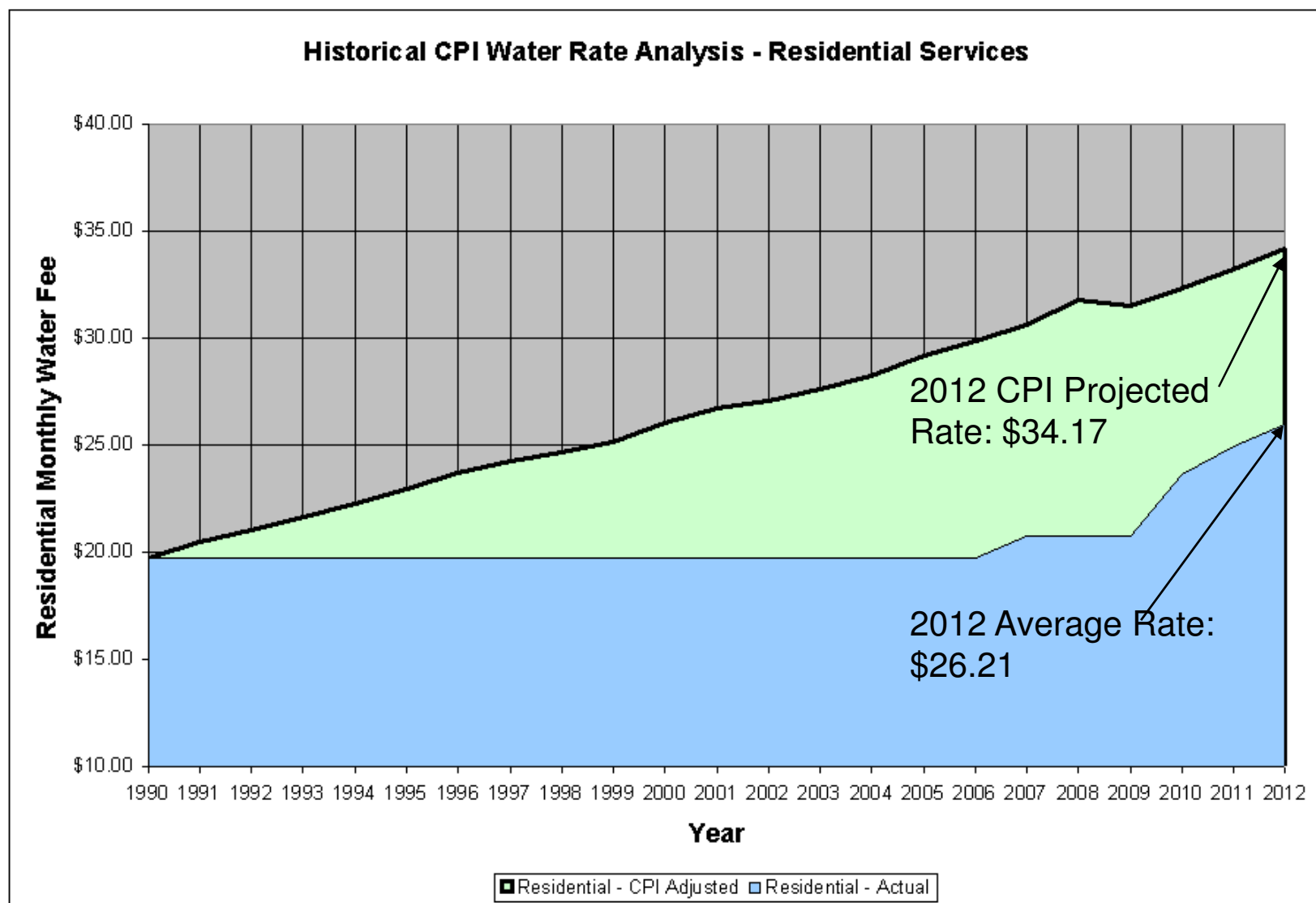
- Proposed 3-Year Rate Structure

	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Residential				
<i>\$/1000 Gallons</i>	\$2.00	\$2.15	\$2.30	\$2.45
<i>Base Minimum</i>	\$10.00	\$12.00	\$12.50	\$13.00
Commercial				
<i>\$/1000 Gallons</i>	\$2.00	\$2.25	\$2.50	\$2.75
<i>Base Minimum</i>				
<i>3/4" to 1"</i>	\$10.00	\$12.00	\$12.50	\$13.00
<i>1-1/4"</i>	\$20.00	\$22.00	\$22.50	\$23.00
<i>1-1/2"</i>	\$30.00	\$32.00	\$32.50	\$33.00
<i>2"</i>	\$40.00	\$42.00	\$42.50	\$43.00
<i>3"</i>	\$60.00	\$62.00	\$62.50	\$63.00
<i>4"</i>	\$80.00	\$82.00	\$82.50	\$83.00

Current

Water Rate Evaluation

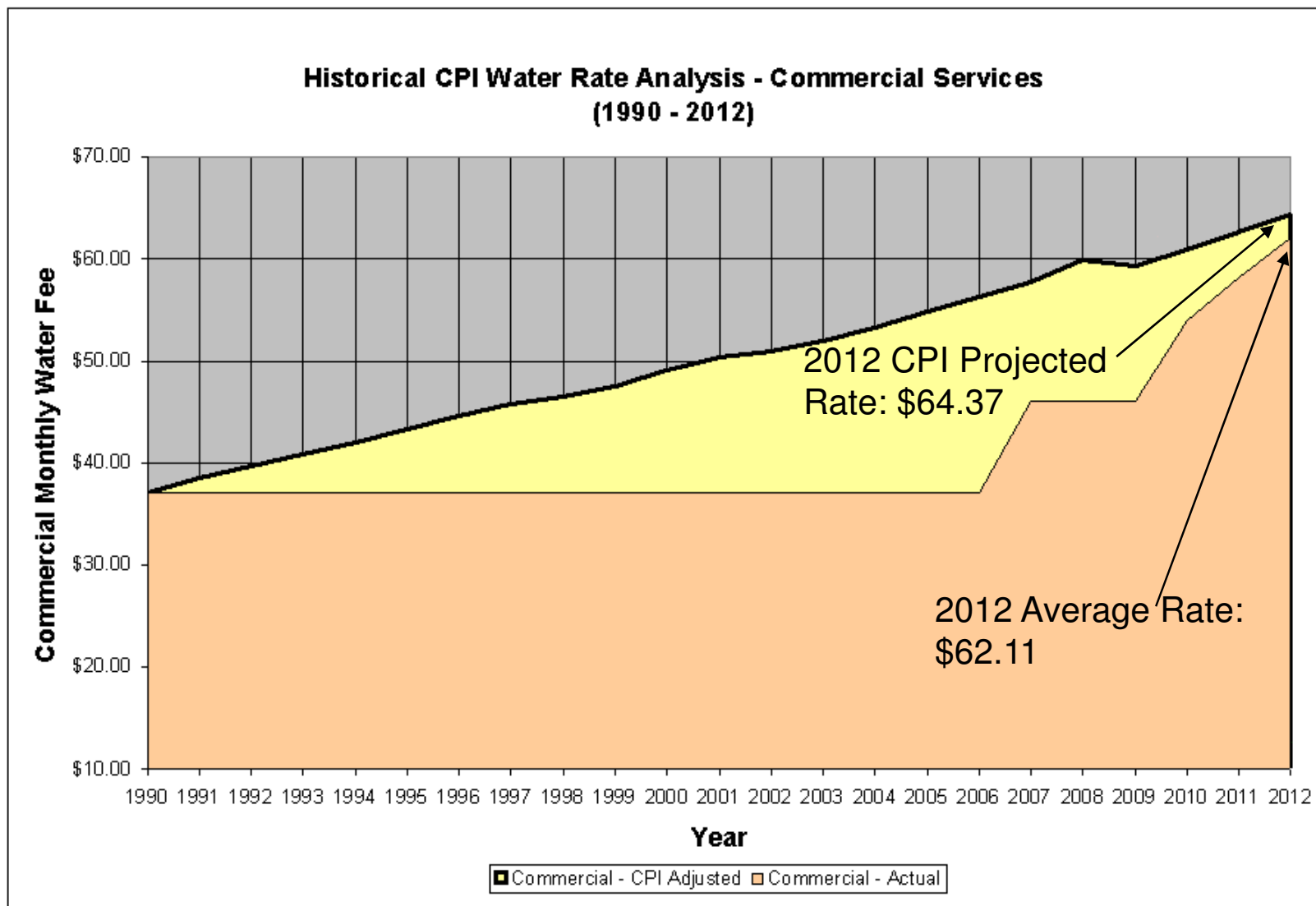
- CPI Comparison (1990 to 2012)



Water Rate Evaluation



- CPI Comparison (1990 to 2012)



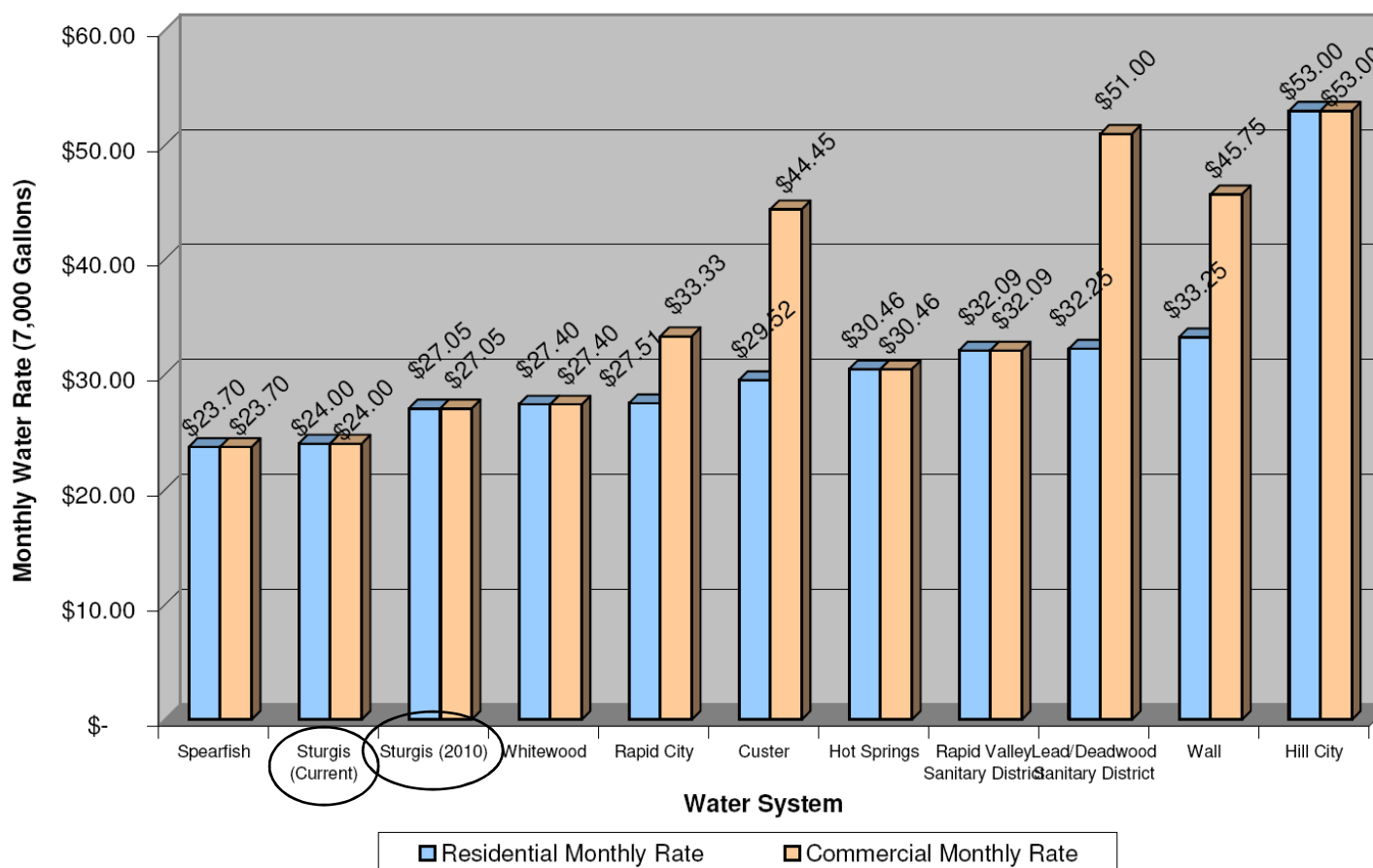
Water Rate Evaluation



- Regional Rate Structures (2009)

- Monthly Rates based on 7,000 gallons consumption
- Commercial Rates based on 1" Service Line (where applicable)

Summary of Regional Water Rates



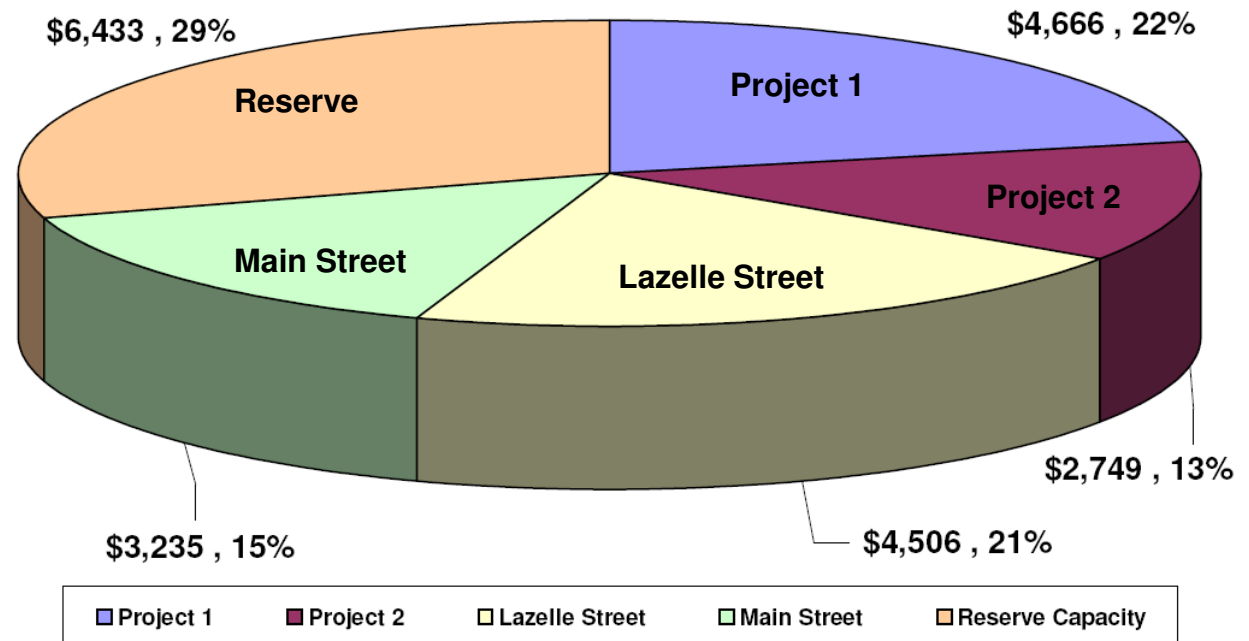
Water Rate Evaluation



- New Rate Structure Analysis

- 2014 – **RD Loan** – (Note: Water Main Projects for Lazelle St & Main St)
- Additional Monthly Revenue Generated based on recommended rate structure
- Reserve Capacity Analysis
 - Project 1 – Year 2010 \$ 1,637,553
 - Project 2 – Year 2012 \$ 964,758
 - Project 3 – Year 2013 \$ 1,579,028
 - Project 4 – Year 2014 \$ 1,068,755
 - Total All 4 Projects: \$ 5,250,094

2014 Reserve Capacity - **RD Loan**
Monthly Analysis



Summary



- **Aging Infrastructure**
- **Proposed Priority Infrastructure Projects**
- **Insufficient Budget for Projects w/
Existing Rates**
- **Water Rate Increase Recommended**
 - **Maintain Water Rate Goals**
- **USDA Rural Development offers 40 Year,
Low Interest, and Potential Grants**

Questions

